REMARKS

A petition for a two month extension of time has today been filed as separate paper and a copy is attached hereto.

A "mixed conductor" by definition is a single material ("one material") exhibiting both electron and proton conduction. See page 2, lines 2-4. The present specification repeatedly refers to a single "compound." See, for example, page 5, lines 3-15. Also note the homogeneous polymeric structures shown in Figs. 1-4 of the drawings.

The "fixing" together of the electron conductor portions and the proton conductor portions, may be by covalent bonding, intercalation and/or inclusion as taught throughout applicant's specification, for example in the Abstract. The characteristic of the product as "exhibiting both electron and proton conduction at a temperature below 200° C" and " below 60° C" is taught at page 15, lines 5-10.

Teachings corresponding to the language of newly added claims 23-25 are found at page 7, lines 2-10.

1. The Rejection of Claims 1 and 7 for Anticipation by Wachsman et al '417

Wachsman et al disclose:

> "a <u>two-phase</u> proton and electron conductor which comprises (a) a proton conductive oxide .... and (b) an electron conductor comprising palladium applied to said proton conductive oxide." [column 3, lines 3-13; emphasis added]

Wachsman emphasize that theirs is a "two-phase structure." In addition to the above quote, also see column 5, line 66 and column 6, lines 5-9, and the claims. Wachsman further teaches that, regardless of the coating method, their product is palladium "<u>coated on</u> the proton conductive oxide". See column 3, lines 20-27 of Wachsman.

Accordingly, the rejection for anticipation by Wachsman is respectfully traversed for the reason that Wachsman neither discloses nor suggests a <u>single material</u> exhibiting both electron and proton conduction.

Further, the two-phase material of Wchsman et al is not considered to exhibit both proton and electron conductivity at temperatures less than about 300° C.

Parenthetically, while palladium itself may provide both electron and proton conductivity, it does not have electron conducting portions and proton conducting portions fixed together as recited.

2. The Rejection of 2-6, 15 and 16 for Obviousness Over Wachsman et al in View of Guitton et al

The rejection is respectfully traversed because, firstly, it is based on a faulty factual premise, i.e. that acetylene black "consists of aliphatic hydrocarbon or aromatic hydrocarbon," quoting from the office action. "Acetylene black" is elemental carbon, not a hydrocarbon. See pages 12 and 219 of *Hawley's Condensed Chemical Distionary* with the Information Disclosure Statement filed today as a separate paper. Further, a rejection based on a theory of inherency does not place the burden of proof on the applicant unless the Examiner can offer a sufficient factual basis for assuming inherency. "It has been held by this court many times that the mere possible inherency in a structure does not give one the right to invoke that doctrine." *In re Betz*

Secondly, the allegedly obvious modification would completely emasculate the teachings of Wachsman et el. which is directed to a tw-phase hydrogen permeation membrane wherein one phase is a perovskite-type oxide.

Thirdly, even if it were obvious to substitute acetylene black for a perovskite-type oxide in Wachsman et al, the result would still be a two phase structure wherein the Pd is merely a coating on the oxide.

3. The Rejection of Claims 8-11 for Obviousness Over Guitton et al

Like Wachsman et al, Guitton et al disclose a two phase structure, i.e. a layer 12 of a "proton conductive solid body" on a mass 14 of (1) an "electron-conductive material" and (2) a " "mixed electron- and proton-conductive material such as manganese oxide ..."

The rejection is respectfully traversed for the reason that the layers of Guitton et al, as a whole, are not a single material. Likewise, within the mass 14 the manganese oxide is neither covalently bound to nor intercalated or included within the "electron-

conductive material". The "mass" 14 of Guitton et al should be understood as being merely a mixture including particles of acetylene black and particles of manganese oxide.

Further, the products of Guitton et al will not show mixed conductivity at temperatures below 200° C.

3. The Rejection of Claims 12-14, 17 and 18 For Obviousness Over Guitton et al in View of Wu

The rejection is respectfully traversed.

The examiner characterizes Wu as teaching, at [0043], a first step of polymerizing a hydrocarbon "with a proton conducting material" and, at [0063], a second step of "burning the high molecular precursor obtained in the first step." Several factual errors are seen in the Examiner's characterizations of Wu. Firstly, paragraphs [0043] and [0063] do not describe first and second steps of any process. Paragraph [0043] describes a process of Kaschmitter et al as prior art and [0063] describes a step in the process invention of Wu. Secondly, apparently, no proton conducting material is mentioned in paragraph [0063] of Wu. What component mentioned by Wu does the Examiner regard as a "proton conducting material"?

Further, there is no apparent reason for combining the reference teaching in the manner suggest by the Examiner. Wu does not produce any mixed conductor. The purpose of Wu in the burning step taught in [0063] is to provide a porous carbon structure, a structure of no apparent relevance to Guitton. The Examiner asserts that the combination would have been obvious because of "a reasonable expectation of success." Success at what?

Substitute drawing sheets and an Information Disclosure Statement have today been submitted as separate papers.

Reconsideration of the rejections of record is respectfully requested in light of the present amendments and foregoing comments.

Respectfully submitted,
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Date: June 28, 2007

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